REMARKS

By this Amendment, independent claims 1, 25 and 31 have been amended to further define the claimed invention over the references of record. In addition, dependent claim 3 has been amended to maintain consistency with the changes to claim 1, while claims 26 and 35 have been cancelled. Although Applicants respectfully submit that the references of record fail to establish a prima facie case of obviousness as to any of the amended claims, a Declaration under 37 C.F.R. §1.132, which has been executed by Applicant, Alex A. Behfar, is also being submitted herewith to establish unexpected results pursuant to the provisions of MPEP §716.02.

Referencing the rejections set forth in the Office Action, claims 1, 3, 25, 26, 31 and 32 are rejected under 35 U.S.C. §103(a) as being unpatentable over the publication to Behfar-Rad et al. entitled "Etched-facet AlGaAs triangular-shaped ring lasers with output coupling" in view of Uchida et al. (US 6,043,104).

In support of this rejection, the Examiner asserts that since V-shaped semiconductor laser cavities formed in an epitaxial structure are known as disclosed in Behfar-Rad et al. and etched gaps separating a laser cavity are known in the art as evidenced by FIG. 1 of Uchida et al., that it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Uchida et al. into the device of Behfar-Rad et al. by adding a gap through one of the legs for at least the purpose of making a composite cavity with improved polarization and phase control; and by adding a DBR for at least the purpose of providing wavelength selective feedback into the laser cavity.

Applicants respectfully traverse this rejection first in view of the amendments made to the claims which clearly would overcome a prima facie case of obviousness under 35 USC §103 and

second, because even if the references still did establish a prima facie case of obviousness, this would be overcome by the unexpected results obtained when the two gaps now recited in the claims are formed in one leg of a plural leg laser cavity as in the claimed invention.

Regarding the amendments to the claims, claims 1, 25 and 31 have been amended to specify that each of the recited structures includes first and second gaps in one leg of the structure as disclosed for example, in FIGs. 5A-5F and 7B of the subject application. Actual experiments were conducted on these embodiments of the invention which confirmed not only that the first and second gaps could result in either the right or left beam from the output facet of the laser or waveguide being more intense than the other, but also that the gaps provided the unexpected result of greatly enhanced side mode suppression ratios of the devices as discussed in greater detail herein.

Applicants respectfully submit that the amendments to the claims overcome a prima facie case of obviousness in view of the combination of Behfar-Rad et al. and Uchida et al. Uchida et al. makes no teaching or suggestion of placing first and second spaced apart etched gaps in one leg of a plural leg laser or waveguide cavity as now recited in the claims. At most, Uchida et al. discloses that it is known to place a gap between two different lasers to provide polarization control of a single cavity formed by the two lasers coupled together. In contrast and as discussed in the subject application, first and second gaps are formed in one leg of a plural leg laser, such as a V-shaped laser to result in either the right or left beam from the output facet of the laser being more intense than the other. Uchida et al. is silent on having either the right or left beam from the output facet of the laser being more intense than the other. Only through the impermissible use of hindsight through reference to Applicant's own disclosure would one of ordinary skill in the art

be motivated from the teachings of Uchida et al. to place first and second gaps in one leg of the V-shaped laser of Behfar-Rad et al. This is not surprising primarily because Uchida et al. discloses a *linear* laser cavity in which the notion of either the right or left beam from the output facet of the laser being more intense than the other is not even a possible consideration. Thus, there is no mention in Uchida et al. of either the right or left beam from the output facet of the laser being more intense than the other and the gap disclosed in Uchida et al. serves a completely different purpose, which is coupling of two different lasers to provide polarization control.

For the foregoing reasons, the combination of Behfar-Rad et al. with Uchida et al. cannot establish a prima facie case of obviousness under 35 U.S.C. 103 as to claims 1, 25 and 31 as amended. The same holds true for the dependent claims.

Further, even if the combination of teachings did establish a prima facie case of obviousness as to any of the amended claims, Applicants respectfully submit that the unexpected results provided by the clamed invention would overcome such a case of prima facie of obviousness. Under MPEP § 716.02, a declaration filed under 37 C.F.R.§ 1.132 may be employed to establish nonobviousness and thereby overcome a prima facie case of obviousness under 35 U.S.C. 103 of a claim based on expected results of the invention recited in the claim. Applicants respectfully submit that the Declaration submitted herewith and executed by Applicant Alex A. Behfar, clearly establishes such unexpected results of the invention as now claimed in claims 1, 25 and 31. In particular, the declaration establishes that experiments were conducted on V-shaped lasers and triangular-shaped ring lasers having first and second etched gaps spaced apart in one of the legs of the laser. The experiments confirmed that either the right or left beam from the output facet of the laser was more intense than the other, as Applicants suspected would be the case.

More importantly, what Applicants did not expect, was that the side mode suppression ratio (SMSR) of the lasers would be increased substantially from about 13 dB for a laser without any gaps to approximately 38 dB for a laser with the two gaps, as indicated in the graph of FIG. 3 of the subject application. Since the decibel (dB) is a well-known logarithmic unit of measurement, the increase from 13 dB to 38 dB in the SMSR represents over a 300 fold improvement of the SMSR. The greatly increased SMSR of the laser with the two gapped leg is advantageous in that it means that the e spectra is more pure. As a result, in fiber optics, for example, the high SMSR allows one to communicate over a longer distance of fiber as compared to a Fabry-Perot laser, for example, that does not have the same spectral purity. Applicants respectfully submit that this substantial increase in SMSR therefore constitutes unexpected results pursuant to the provisions of MPEP §716.02 that are sufficient to overcome a prima facie case of obviousness, even if it were established by the references of record, as to any of the claims as amended.

In view of the foregoing, Applicants respectfully submit that the rejection of claims 1, 3, 25, 31 and 32 is traversed. As a result, Applicants also respectfully submit that dependent withdrawn claims 2, 4, 14-16, 28-30, and 33-36 are now in condition for rejoinder pursuant to the provisions of MPEP § 821.04. Accordingly, Applicants respectfully request withdrawal of the restriction requirement along with rejoinder and allowance of these dependent claims.

In view of the foregoing, Applicants respectfully submit that all of the rejections are traversed and that all of the pending claims are patentable and allowable. Accordingly, favorable reconsideration of the application is respectfully requested.

Respectfully Submitted,

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